

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

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Title: COPPER-CONTAINING C4 BALL-LIMITING METALLURGY STACK FOR ENHANCED RELIABILITY OF PACKAGED STRUCTURES AND METHOD OF MAKING SAME

Assignee: Intel Corporation

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Dkt: 884.522US1 (INTEL)

IN THE CLAIMS

Please cancel claims 3-9, 23-28, 30-33, and 36-39.

Please amend the claims as follows:

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1. (Currently Amended) A ball-limiting metallurgy (BLM) stack comprising:
a metal adhesion first layer disposed above and on a metallization;
a metal second layer disposed above and on the metal adhesion first layer;
a metal third layer disposed above and on the metal second layer;
an electrically conductive bump disposed above and on the metal third layer; and
wherein the metal second layer comprises a copper layer and wherein the metal third
layer comprises a copper stud wherein at least one of the metal second layer and the metal third
layer comprises copper.

B/ 2. (Original) The BLM stack according to claim 1, wherein the metal adhesion first layer is selected from Ti, TiW, W, and Cr.

3-9. (Cancelled)

10. (Original) The BLM stack according to claim 1, further comprising:
an intermetallic layer disposed between the metallization and the electrically conductive bump.

11. (Original) The BLM stack according to claim 1, wherein the electrically conductive bump comprises a tin-lead solder composition selected from Sn37Pb, Sn97Pb, and Sn_xPb_y, wherein x+y total 1 and wherein x is in a range from about 0.3 to about 0.99.

12-28. (Cancelled)

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29. (Previously Added) The BLM stack according to claim 1, wherein the metal adhesion first layer includes a Ti composition, wherein the Ti composition has a thickness in a range from about 500 Å to about 4,000 Å.

30-33. (Cancelled)

34. (Previously Added) The BLM stack according to claim 1, wherein the metal third layer includes a copper stud over the metal second layer, wherein the copper stud has a thickness in a range from about 5 micrometers to about 15 micrometers.

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cont. 35. (Previously Added) The BLM stack according to claim 1, wherein the metal third layer includes a copper stud over the metal second layer, wherein the copper stud has a thickness in a range from about 5 micrometers to about 15 micrometers, and wherein the metal second layer has a thickness in a range from about 1,000 Å to about 5,000 Å.

36-39. (Cancelled)